HATCHERY AND GENETIC MANAGEMENT PLAN (HGMP)

Hatchery Program:	Wallace River Summer Chinook Fingerling
Species or Hatchery Stock:	Wallace River Summer Chinook (Onchorynchus tshawytscha)
Agency/Operator:	Washington Department of Fish and Wildlife
Watershed and Region:	Snohomish River Puget Sound
Date Submitted:	, 2002
Date Last Updated:	August 21, 2002

SECTION 1. GENERAL PROGRAM DESCRIPTION

1.1) Name of hatchery or program.

Wallace River Summer Chinook Fingerling Program

1.2) Species and population (or stock) under propagation, and ESA status.

Wallace River Summer Chinook (*Oncorhynchus tshawytscha*)

1.3) Responsible organization and individuals

Name (and title):	Chuck Johnson, Operations Manager	
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Other agencies, Tribes, co-operators, or organizations involved, including contractors, and extent of involvement in the program:

In addition to the WDFW Wallace River summer chinook production, 200,000 eyed eggs are transferred to the Tulalip Tribal Hatchery for incubation, rearing and release as subyearling smolts. This program is being conducted to evaluate the possibility of using this stock of fish for production in the future.

1.4) Funding source, staffing level, and annual hatchery program operational costs.

Funding for this program is provide through the State General Fund.

1.5) Location(s) of hatchery and associated facilities.

Wallace River Hatchery: Wallace River (07.0490) RM 4 at confluence with May Creek (07.0943)

1.6) Type of program.

Integrated Harvest

1.7) Purpose (Goal) of program.

Augmentation

The Wallace Hatchery summer chinook fingerling program is used as a Double-Index Tag (DIT) group. Of the 1,000,000 released, 600,000 are mass marked (adipose-fin clip only), 200,000 adipose-fin clip/coded-wire tagged (Ad + CWT) and 200,000 coded-wire tagged only. The 600,000 mass marked can provide NOR/HOR ratio's on the spawning grounds in the Snohomish River watershed. The DIT group can serve as an index group for wild fingerling summer chinook as well as providing data on catch contributions, run timing, total survival, migration patterns and straying into other watersheds.

1.8) Justification for the program.

This program will be operated to provide fish for harvest while minimizing adverse genetic, demographic or ecological effects on listed fish. This will be accomplished in the following manner:

1) Juvenile chinook will be released as smolts to minimize emigration time to saltwater thereby minimizing potential competition with and predation on listed fish.

2) Juvenile chinook will be released after the usual wild chinook emigration time to minimize potential adverse interactions.

3) All juvenile chinook released will be acclimated at a hatchery facility capable of trapping the majority of returning adults. This practice will minimize straying and make possible the removal or regulation of hatchery fish allowed to spawn naturally.

4) All juvenile chinook will be marked to distinguish them from wild or naturally spawning chinook.

5) Adult chinook produced from this program will be harvested at a rate that allows adequate escapement of listed chinook .

1.9) List of program "Performance Standards".

1.10) List of program "Performance Indicators", designated by "benefits" and "risks."

Performance Standards and Indicators for Puget Sound **Integrated Harvest** Chinook programs.

Performance Standard	Performance Indicator	Monitoring and Evaluation Plan
Produce adult fish for harvest	Survival and contribution rates	Monitor catch and measuring survivals by periodical CWT data.

Meet hatchery production goals	Number of juvenile fish released **1,000,000**	Estimating number of fish planted (weighing / counting fish), monitoring proximity to hatchery production goals, number released recorded on hatchery divisions "plant reports", data available on WDFW data base. Future Brood Document (FBD).
Manage for adequate escapement	Hatchery and wild return rates	Monitoring hatchery/wild return rates through trapping (at the hatchery or at weir), redd and snorkel surveys on the spawning grounds plus catch records.

Minimize interactions with listed fish through proper broodstock management	Total number of broodstock collected - **1800 adults** for entire program	Measuring number of fish actually spawned and killed to meet egg take goal at the hatchery. Hatchery records. Hatchery records and spawning guidelines.
	Sex ratios	
	Timing of adult collection/spawning - **June 1 to August/September**	Start trapping prior to historical start of the run, continue trapping throughout the run, dates and times are recorded on hatchery divisions "adult reports", data available on WDFW data base.
	Number of listed fish passed upstream - **to be determined**; **approximately 500 fish into the Wallace River**	Hatchery records.
	Hatchery stray rate **<4% inside GDU; dependent on acceptable risk profile <1% outside GDU**	CWT data and spawning ground surveys
	Number wild fish used in broodstock - **to be determined**	Hatchery records
	Return timing of hatchery / wild adults - **June to mid-August**	Hatchery records
	Adherence to spawning guidelines - **1:1 mating, pooled in lots of 5**	Hatchery records and spawning guidelines.

Minimize interactions with listed fish through proper rearing and release strategies	Juveniles released as smolts	FBD and hatchery records
	Out-migration timing of listed fish / hatchery fish **unknown/ June**	Hatchery records and historical natural out-migrant data FBD and hatchery records
	Size and time of release **70 fpp/June release**	CWT data and mark / unmarked ratios of adults
Maintain stock integrity and genetic diversity	Effective population size	Spawning guidelines
	Hatchery-Origin Recruit spawners	Spawner surveys
Maximize in-hatchery survival of broodstock and their progeny; and Limit the impact of pathogens associated with hatchery stocks, on listed fish	Fish pathologists will monitor the health of hatchery stocks on a monthly basis and recommend preventative actions / strategies to maintain fish health	Co-Managers Disease Policy Fish Health Exam Reports
	Fish pathologists will diagnose fish health problems and minimize their impact	
	Vaccines will be administered when appropriate to protect fish health	
	A fish health database will be maintained to identify trends in fish health and disease and implement fish health management plans based on findings	

	Fish health staff will present workshops on fish health issues to provide continuing education to hatchery staff.	
Ensure hatchery operations comply with state and federal water quality standards through proper environmental monitoring	NPDES compliance	Monthly NPDES records

1.11) Expected size of program.

1.11.1) Proposed annual broodstock collection level (maximum number of adult fish).

900 pair of summer chinook are needed for the program which includes the fingerling and yearling programs at Wallace River Hatchery as well as eggs to be transferred to the Tulalip Tribe.

1.11.2) Proposed annual fish release levels (maximum number) by life stage and location.

Life Stage	Release Location	Annual Release Level
Eyed Eggs		
Unfed Fry		
Fry		
Fingerling	Wallace River (07.0940)	1,000,000
Yearling		

* 200,000 additional transferred to Tulalip Tribe.

1.12) Current program performance, including estimated smolt-to-adult survival rates, adult production levels, and escapement levels. Indicate the source of these data.

Wallace River summer chinook fingerlings were coded-wire tagged brood years 1971, 1972 and 1985. The 1985 brood year survived at 0.10% (RMIS database). At this survival, the current program of 1,000,000 would produce 1000 adults.(more data forthcoming with more recent tagging of releases). Escapement levels back to the hatchery rack for broodyears 1995 through 2001 were 1,420, 1,310, 946, 1,093, 1,731, 3,707 and 2,723, respectively.

1.13) Date program started (years in operation), or is expected to start.

1973

1.14) Expected duration of program.

Ongoing

1.15) Watersheds targeted by program.

Snohomish River watershed - (WRIA 07)

1.16) Indicate alternative actions considered for attaining program goals, and reasons why those actions are not being proposed.

SECTION 2. PROGRAM EFFECTS ON ESA-LISTED SALMONID POPULATIONS.

2.1) List all ESA permits or authorizations in hand for the hatchery program.

None

2.2) Provide descriptions, status, and projected take actions and levels for ESA-listed natural populations in the target area.

2.2.1) Description of ESA-listed salmonid population(s) affected by the program.

- Identify the ESA-listed population(s) that will be directly affected by the program.

Snohomish summer chinook spawning in the upper Snohomish and Skykomish basins. This is a native stock that has been classified as depressed due to chronic low escapements (1992 SASSI)

- Identify the ESA-listed population(s) that may be incidentally affected by the program.

Other Snohomish Basin Chinook populations:
1) Wallace River summer/fall chinook which spawns in the Wallace River. It is a composite stock that has been classified as healthy (1992 SASSI)
2) Snohomish fall chinook stock which spawns in the Snoqualmie basin as well as the Pilchuck River, Sultan River, Woods Creek and Elwell Creek. It is considered to be a native stock and has been classified as depressed due to low escapement trends (1992 SASSI)
3) Bridal Veil Creek Fall Chinook stock spawns in the south fork Skykomish River, including Bridal Veil Creek, as well as the North Fork Skykomish up to Bear Creek (RM 13.1). It is considered to be native and its stock status is classified as unknown (1992 SASSI).

Skykomish Bull Trout:
1) A single stock that spawns in the south fork Skykomish River including West Cady Creek, Goblin Creek, Troublesome Creek, Salmon Creek and the east fork Foss Creek, tributaries to the south fork Skykomish River. This stock is considered to be a native stock that has been classified as healthy based on increasing escapement trends (1998 SASSI bull trout and Dolly Varden appendix).

2.2.2) Status of ESA-listed salmonid population(s) affected by the program.

- Describe the status of the listed natural population(s) relative to "critical" and "viable" population thresholds

Critical and viable population thresholds under ESA have not yet been determined. SaSSI designations are stated in 2.2.1 above.

- Provide the most recent 12 year (e.g. 1988-present) progeny-to-parent ratios, survival data by life-stage, or other measures of productivity for the listed population. Indicate the source of these data.

1.358 : 1 for 1990 to 1999

- Provide the most recent 12 year (e.g. 1988-1999) annual spawning abundance estimates, or any other abundance information. Indicate the source of these data.

Recent Escapements: (composite of summer and fall run chinook)

1989	3138
1990	4209
1991	2783
1992	2708
1993	3866
1994	3626
1995	3176
1996	4851
1997	4292
1998	6304
1999	4790

- Provide the most recent 12 year (e.g. 1988-1999) estimates of annual proportions of direct hatchery-origin and listed natural-origin fish on natural spawning grounds, if known.

New information indicates that there are substantial numbers of hatchery fish spawning in the wild with 30 to 50% of the spawners in the Skykomish River and approximately 10% in the Snoqualmie portion of the basin being of hatchery-origin.

2.2.3) Describe hatchery activities, including associated monitoring and evaluation

and research programs, that may lead to the take of listed fish in the target area, and provide estimated annual levels of take

- Describe hatchery activities that may lead to the take of listed salmonid populations in the target area, including how, where, and when the takes may occur, the risk potential for their occurrence, and the likely effects of the take.

Wild-origin summer chinook may enter the trap and may be spawned with the hatchery counterpart as they are not readily distinguished from the hatchery stock (all fingerlings now are all marked, see Section 1.7). Their eggs and resultant fry will be cultured along with the hatchery stock.

Juvenile releases may cause an unknown predation or competition risk to listed fish.

The hatchery, located at the confluence of May Creek and the Wallace River operates two adult weirs on both systems. The May Creek weir is in place from June thru November. The Wallace River weir is in place from June to October 1st. Due to limited habitat, Cryptobia (parasite) problems and water quality problems, chinook are not allowed above the May Creek weir. All chinook entering the Wallace River are diverted into an adult pond. Approximately 500 chinook are passed upstream to spawn in the watershed. The numbers are regulated to limit Cryptobia sp. problems at the hatchery.

- Provide information regarding past takes associated with the hatchery program, (if known) including numbers taken, and observed injury or mortality levels for listed fish.

Not known.

Provide projected annual take levels for listed fish by life stage (juvenile and adult). quantified (to the extent feasible) by the type of take resulting from the hatchery program (e.g. capture, handling, tagging, injury, or lethal take).

See "take" table at the end of the HGMP

- Indicate contingency plans for addressing situations where take levels within a given year have exceeded, or are projected to exceed, take levels described in this plan for the program.

SECTION 3. RELATIONSHIP OF PROGRAM TO OTHER MANAGEMENT OBJECTIVES

3.1) Describe alignment of the hatchery program with any ESU-wide hatchery plan (e.g. *Hood Canal Summer Chum Conservation Initiative*) or other regionally accepted policies (e.g. the NPPC *Annual Production Review* Report and Recommendations - NPPC document 99-15). Explain any proposed deviations from the plan or policies.

There are no ESU-wide hatchery plans or other regionally accepted policies currently in place.

3.2) List all existing cooperative agreements, memoranda of understanding, memoranda of agreement, or other management plans or court orders under which program operates.

There are agreements between WDFW and the Tulalip Tribe to mass mark chinook and to develop a summer chinook indicator stock for the Snohomish system. Production numbers and appropriate stocks to be used are also outlined in a Memorandum of Understanding (MOU) between the tribe and WDFW (WDFW, 1997).

3.3) Relationship to harvest objectives.

3.3.1) Describe fisheries benefitting from the program, and indicate harvest levels and rates for program-origin fish for the last twelve years (1988-99), if available.

Program fish contribute to the Washington State marine sport and commercial fisheries as well as the Tribal net fishery and in-river sport fishery.

3.4) Relationship to habitat protection and recovery strategies.

3.5) Ecological interactions.

Predation by Wallace River summer chinook fingerlings on naturally produced chinook in the Snohomish basin is considered "low" risk (WDFW Risk Assessment, 2000) as the fish are roughly the same size at outmigration.

Competition by Wallace River summer chinook fingerlings on naturally produced chinook in the Snohomish basin is considered "high" risk (WDFW Risk Assessment, 2000)

Yearling coho production at Wallace River has been reduced from 300,000 to 150,000 recently. This reduction may help to minimize competition and predation interactions between hatchery coho and naturally produced chinook.

SECTION 4. WATER SOURCE

4.1) Provide a quantitative and narrative description of the water source (spring, well, surface), water quality profile, and natural limitations to production attributable to the water source.

The Wallace River and May Creek are the two sources of water used for incubating and rearing summer chinook at Wallace River Hatchery. Both of these are surface water in origin. Both sources exhibit similar temperature profiles ranging from the mid 30°s to the upper 60°s F. They are small streams that are subject to rapid changes in flow and height

especially during the winter flood months. Water for the hatchery is pumped from both sources: The Wallace River can provide as much as 12,000 gpm. 5,800 gpm is available from May Creek. The facility is covered under NPDES permit # WAG 133006
The intake screens on the Wallace River and May Creek are believed to be compliant and pose a very low take risk to listed species.

4.2) Indicate risk aversion measures that will be applied to minimize the likelihood for the take of listed natural fish as a result of hatchery water withdrawal, screening, or effluent discharge.

The facility has two intake structures, one on May Creek the other on the Wallace River. Chinook are not passed above the May Creek intake. The May Creek intake has 1" x .125" screen and is believed to be compliant. The Wallace River Intake screens have recently been replaced with compliant mesh. Chinook are passed above the Wallace River intake.

SECTION 5. FACILITIES

5.1) Broodstock collection facilities (or methods).

Wallace River Hatchery has two adult collection facilities. The first is an instream trap located on May Creek. The trap measures 70 ft. at its widest point and is 110 ft. in length. There are 2 step-type ladders located on the lower end of the trap and a picket-type rack is located at the upper end of the pond. The trap is dependent on the natural flow of May Creek for its water supply. The second trapping facility consists of a series of 3 100 ft x 20 ft x 6 ft adult capture ponds. A weir is placed across the Wallace River the first week in June and remains in place until October 1st. This is done to encourage chinook migration up the denil-style fish ladder that supplies the adult ponds. Water is pumped from the Wallace River for these ponds. After the adult capture season ends (December) these ponds are populated with yearling coho which remain until their release in May.

5.2) Fish transportation equipment (description of pen, tank truck, or container used).

Does not apply.

5.3) Broodstock holding and spawning facilities.

Summer chinook broodstock are held in the three adult capture ponds until spawning. Spawning facilities are located at ends of these ponds.

5.4) Incubation facilities.

The incubation facility at Wallace River consists of 1152 "Heath" style vertical incubators. These incubators are supplied with 4 gpm of water from May Creek.

5.5) Rearing facilities.

There are 3 types of rearing vessels used at Wallace River: 6 - 100ft X 10ftX4ft raceways, 4 - 80ft X 20ft X 4ft standard ponds and 3 - 1000ft X 28ft X 5 ft rearing channels. Typically fry are ponded in either the raceways or standard ponds and reared until they reach 400 fish/lb. At this point the fish are transferred to the rearing channels for the rest of the rearing period and eventual release. The program goal for release is the first week of June with a size target of 70 fish/lb.

5.6) Acclimation/release facilities.

Fish are acclimated on May Creek and/or Wallace River water their entire time in the hatchery. See section 5.5

5.7) Describe operational difficulties or disasters that led to significant fish mortality.

Because surface water is the source for the hatchery the threats from diseases and parasites present the most significant threat to fish health. Additionally, electrical power is required to supply water to the ponds therefore the loss of power also presents a constant threat.

5.8) Indicate available back-up systems, and risk aversion measures that will be applied, that minimize the likelihood for the take of listed natural fish that may result from equipment failure, water loss, flooding, disease transmission, or other events that could lead to injury or mortality.

Wallace River Hatchery is staffed with five full time employees, one of which is in standby status 24 hours a day seven days a week. All staff are very familiar with the workings of the hatchery and have received training in fish cultural techniques and disease recognition and prevention issues. Additionally, fish health staff make frequent visits to the hatchery to check the health of fish stocks and are available immediately in case of a disease outbreak. The hatchery is equipped with a sophisticated alarm system that monitors flow and other conditions critical to hatchery operations. There is a standby power generator capable of supplying all of the electrical needs of the hatchery in case of a loss of power.

SECTION 6. BROODSTOCK ORIGIN AND IDENTITY

Describe the origin and identity of broodstock used in the program, its ESA-listing status, annual collection goals, and relationship to wild fish of the same species/population.

6.1) Source.

Adult chinook returning to the Wallace River Hatchery between June 1 and August 15 are used as summer chinook broodstock.

6.2) Supporting information.

6.2.1) History.

There is a considerable history of introductions of out-of-basin stocks into the Snohomish system. The most common introduced stock has been the Green River chinook. The spawning population of summer chinook was originally recruited from fish that returned to the fish passage facility at Sunset Falls on the Skykomish River in the early 1970s. Since that time the only source of eggs has been adult fish that return to the traps at the Wallace River Hatchery.

6.2.2) Annual size.

900 pair of summer chinook are needed for the program which includes the fingerling and yearling programs at Wallace River as well as eggs to be transferred to the Tulalip Tribe.

6.2.3) Past and proposed level of natural fish in broodstock.

Returning hatchery fish will be identifiable (adipose-fin clip only) starting in 2004. Past levels of natural broodstock in the hatchery population are unknown. WDFW shall investigate the feasability of incorporating summer chinook returning to Sunset Falls into the hatchery broodstock The Sunset Falls fish making up to 10% of the broodstock. .

6.2.4) Genetic or ecological differences.

None known.

6.2.5) Reasons for choosing.

Green River-origin hatchery fall chinook had been propagated at Wallace River. To reduce adverse genetic and ecological interactions with naturally produced chinook in the Snohomish drainage, the decision was made to eliminate the fall chinook production and to replace that production with a more appropriate stock at Wallace River Hatchery; the indigenous summer chinook originally collected at Sunset Falls.

6.3) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic or ecological effects to listed natural fish that may occur as a result of broodstock selection practices.

The summer chinook fingerlings produced at Wallace River are mass marked as well as Double-Index Tagged (DIT'd). Starting in 2004, all hatchery-origin adult summer chinook will be identifiable and used for broodstock. The fall chinook program has been eliminated.

SECTION 7. BROODSTOCK COLLECTION

7.1) Life-history stage to be collected (adults, eggs, or juveniles).

Adults.

7.2) Collection or sampling design.

Adult traps are operated on May Creek and the Wallace River starting on June 1st for the purpose of collecting summer chinook. Trapping efforts will end on August 15th. There are racks associate with each trap that span the width of the river or creek. Trapping efficiency is very much dependent on water flow. In low flow years the fish are much more reluctant to enter the traps and are more likely to spawn naturally below the hatchery

During 2001-2003, trapping for summer chinook will take place from June 1 to August 15th to reduce the possibility that fall chinook adults would also be captured and included in the summer chinook broodstock pool. Adults entering the trap during this time period in excess to egg needs, or adults returning subsequent to the August 15th will be returned to the river to spawn naturally. Tulalip Hatchery summer chinook egg requirements in 2001-2002 will also be met from adults returning to the hatchery from June 1 to August 15

Adults returning to the hatchery after September 1 will be collected and spawned to provide eggs for the Tulalip Tribal fall chinook program at Tulalip Hatchery (the Wallace Hatchery fall chinook program has been eliminated). Should these returns be insufficient to meet the tribal needs, Green River origin hatchery fall chinook from Samish or Green River Hatcheries will be used to make up the shortfall (WDFW, Tulalip Tribe MOU)

Beginning is 2004, only marked adult fish volunteering to the Wallace River Trap will be used to meet hatchery requirements. Unmarked fish or marked fish in excess of hatchery needs will be returned to the river to spawn naturally.

7.3) Identity.

Chinook trapped from June 1 to August 15 are used for broodstock. Examination of hatchery escapement coded-wire tag data shows that in 1996 there were no coded-wire tagged chinook used for broodstock, in 1997 there were 3 coded-wire tag recoveries, all non-Wallace River summer chinook (2 Mission Creek spring chinook and 1 Wallace River fall chinook and in 1998 there were 4 coded-wire tag recoveries (2 Marblemount spring chinook, 1 Wallace River summer chinook and 1 Wallace River fall chinook, all were incorporated into the broodstock).

7.4) Proposed number to be collected:

7.4.1) Program goal (assuming 1:1 sex ratio for adults):

A total of 600 adults are needed to support the summer chinook fingerling program at Wallace River, 300 additional adults are needed to fulfill the yearling program and the egg transfer to the Tulalip Tribe.

7.4.2) Broodstock collection levels for the last twelve years (e.g. 1988-99), or for most recent years available:

Year	Adults			Eggs	Juveniles
	Females	Males	Jacks		
1988	69	138	18	304,000	
1989	296	431	25	1,192,000	
1990	48	121	7	192,000	
1991	99	119	9	360,000	
1992	188	217	48	736,000	
1993	309	401	45	1,196,000	
1994	99	140	12	399,000	
1995	337	231	21	1,430,000	
1996	417	430	9	1,915,000	
1997	396	331	13	1,695,000	
1998	319	367		1,264,500	
1999	403	404		1,685,000	
2000	409	304	1	2,045,000	
2001	329	331		1,420,000	

7.5) Disposition of hatchery-origin fish collected in surplus of broodstock needs.

Some chinook returning to the Wallace River Hatchery in excess of broodstock needs are passed upstream to spawn naturally. However, if they had originally been inoculated with antibiotics, they are killed and buried on station.

7.6) Fish transportation and holding methods.

There is no transportation of adult chinook at this facility. All adults are held in 3 - 100 ft x 20 ft x 6 ft adult ponds. Virtually all of the fish arrive at the hatchery "green" and must be held as long as 110 days, until "ripe". During this time they are treated with antibiotics for the control of disease and with formalin to resist the growth of parasites and fungus.

7.7) Describe fish health maintenance and sanitation procedures applied.

See section 7.6 Extensive use of iodophore disinfectant is used to minimize contaminants and the spread of disease during spawning procedures. Pre spawning adults are inoculated with antibiotics to minimize the possible spread of disease. Formalin is used to control parasites and fungus growth on adult fish. Additionally, all female adults are sampled for the presence of bacterial kidney disease.

7.8) Disposition of carcasses.

Spawned and unspawned carcasses that have not been exposed to antibiotics or chemical treatment are typically sold to a fish buyer, otherwise, all carcasses are buried on station.

7.9) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic or ecological effects to listed natural fish resulting from the broodstock collection program.

See section 7.2

SECTION 8. MATING

Describe fish mating procedures that will be used, including those applied to meet performance indicators identified previously.

8.1) Selection method.

Adult chinook are selected randomly over the entire run (June 1 - August 15).

8.2) Males.

No back up males or repeat spawners are used. Jacks are spawned at a rate of 2% over the spawning season

8.3) Fertilization.

Equal sex ratios are used in 1 to 1 matings. Gametes are then pooled in lots of 5.

8.4) Cryopreserved gametes.

Not applicable

8.5) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic or ecological effects to listed natural fish resulting from the mating scheme.

SECTION 9. INCUBATION AND REARING -

Specify any management *goals* (e.g. "egg to smolt survival") that the hatchery is currently operating under for the hatchery stock in the appropriate sections below. Provide data on the success of meeting the desired hatchery goals.

9.1 Incubation:

9.1.1) Number of eggs taken and survival rates to eye-up and/or ponding.

Goal 1,700,000 eggs. Green to eyed survival 89.45 to 92.3% (90.6% avg.)

9.1.2) Cause for, and disposition of surplus egg takes.

Current management approaches do not allow for the taking of eggs in surplus of program goals. If losses are too high, then goals are not met.

9.1.3) Loading densities applied during incubation.

Wallace River summer chinook eggs average 1450 per pound. They are placed in Heath style incubators at a loading of 6000 eggs per tray. Each half-stack (8 trays) receives 4 gpm of inflow.

9.1.4) Incubation conditions.

Temperature of inflowing water is monitored and recorded daily. Dissolved oxygen is checked on an infrequent basis and silt management is accomplished by rodding the trays and brushing tray screens. Since this is a surface water source, siltation is dealt with on a frequent basis and during flood events the incubators sometimes need constant attention.

9.1.5) Ponding.

A kd index of 1.97 - 2.00 is used as the criteria for initial ponding of fry. Ponding typically occurs from mid-December to mid-January. All pondings are forced.

9.1.6) Fish health maintenance and monitoring.

All incubators are subject to a daily 15 minute drip treatments of formalin for the control of fungus and disease. These treatments start 2 days after intial fertilization and continue until approximately 1 week prior to hatching. At the "eyed" stage the eggs are removed from the trays and shocked. All non-viable eggs are then removed by either an automated egg picker or by hand.

9.1.7) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic and ecological effects to listed fish during incubation.

9.2) Rearing:

9.2.1) Provide survival rate data (*average program performance*) by hatchery life stage (fry to fingerling; fingerling to smolt) for the most recent twelve years (1988-

99), or for years dependable data are available..

9.2.2) Density and loading criteria (goals and actual levels).

Numerous criteria are applied depending on the fish's size, the pond style they reside in, water quality, water temperature, relative health and water conditions. However, as a rule, the criteria limits loadings to a maximum of 3 lbs fish/gpm of flow until they have reached a size of 100 fish/lb.

9.2.3) Fish rearing conditions

Water temperatures are monitored on a daily basis. Water flows are checked at least weekly. Each pond is monitored for loss and loss is picked daily. Ponds are vacuumed on an as needed basis (typically weekly). General health of the fish is monitored by Fish Health staff on a biweekly basis.

9.2.4) Indicate biweekly or monthly fish growth information (*average program performance*), including length, weight, and condition factor data collected during rearing, if available.

Routine sampling of fish occurs on a weekly basis until the fish reach a size of 100 fish/lb at this time sampling shifts to a biweekly schedule. The fish are sampled for weight, length, condition factor and coefficient of variance.

9.2.5) Indicate monthly fish growth rate and energy reserve data (*average program performance*), if available.

Not available.

9.2.6) Indicate food type used, daily application schedule, feeding rate range (e.g. % B.W./day and lbs/gpm inflow), and estimates of total food conversion efficiency during rearing (*average program performance*).

Diets supplied by Moore-Clark and BioOregon are used in rearing Wallace River summer chinook. The diets are typically "dry" or "semi-dry" in nature and included starter diets, crumbles and pellet type feeds. Daily percent of body weight fed varies depending on the size of the fish, temperature of the water and time of year. However, the range is usually from 1-3% B.W./day. Overall food conversion is typically 1.1 to1.2.

9.2.7) Fish health monitoring, disease treatment, and sanitation procedures.

Sanitation procedures include the use of iodophore solutions as disinfectant for tools and nets and other equipment used between ponds and stocks of fish. Fish Health staff monitor the fish on a biweekly basis and disease treatment is done on an as-needed basis.

9.2.8) Smolt development indices (e.g. gill ATPase activity), if applicable.

Not measured

9.2.9) Indicate the use of "natural" rearing methods as applied in the program.

None

9.2.10) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic and ecological effects to listed fish under propagation.

SECTION 10. RELEASE

Describe fish release levels, and release practices applied through the hatchery program.

The program goal is to release 1,000,000 fish at 70 fish/lb during the first week of June. A coefficient of variance of 8 or less is desired

10.1) Proposed fish release levels. *(Use standardized life stage definitions by species presented in **Attachment 2**. "Location" is watershed planted (e.g. "Elwha River").)*

Age Class	Maximum Number	Size (fpp)	Release Date	Location
Eggs				
Unfed Fry				
Fry				
Fingerling	1,000,000	70	June	Wallace River
Yearling				

10.2) Specific location(s) of proposed release(s).

Stream, river, or watercourse: Wallace River (07.0940)
Release point: Wallace River Hatchery (RM 4)
Major watershed: Snohomish River
Basin or Region: Puget Sound

The fish are released on-station from the Wallace River Hatchery directly into the Wallace River. The Wallace River drains to the Snohomish River watershed which flows into Puget Sound

10.3) Actual numbers and sizes of fish released by age class through the program.

Release year	Eggs/ Unfed Fry	Avg size	Fry	Avg size	Fingerling	Avg size	Yearling	Avg size
1988								

Release year	Eggs/ Unfed Fry	Avg size	Fry	Avg size	Fingerling	Avg size	Yearling	Avg size
1989								
1990			339,000	350 fpp	694,100	91 fpp		
1991								
1992					125,600	53 fpp		
1993					404,500	50 fpp		
1994					642,700	70 fpp		
1995								
1996					918,000	82 fpp		
1997					1,120,000	70 fpp		
1998					920,000	74 fpp		
1999					384,050	90 fpp		
2000					835,000	59 fpp		
2001					1,223,194	58 fpp		
Average					726,714	70 fpp		

10.4) Actual dates of release and description of release protocols.

The fish are released during the first week of June usually on a day of high flow to encourage downstream migration. This is to minimize their exposure to predation and reduce interactions with wild fish.

10.5) Fish transportation procedures, if applicable.

None

10.6) Acclimation procedures.

Incubated and reared on the same water source (river) prior to release.

10.7) Marks applied, and proportions of the total hatchery population marked, to identify hatchery adults.

The fish are 100% identifiable as hatchery-origin fish. There is currently an agreement between WDFW and the Tulalip Tribe to release 600,000 mass marked (Ad clip only),

200,000 adipose-fin clip/coded-wire tagged (Ad + CWT) and 200,000 coded-wire tagged only fingerling summer chinook to represent a double index group.

10.8) Disposition plans for fish identified at the time of release as surplus to programmed or approved levels.

No surplus fish at this stage.

10.9) Fish health certification procedures applied pre-release.

Fish Health staff evaluates the fish a maximum of 2 weeks prior to release.

10.10) Emergency release procedures in response to flooding or water system failure.

In the case of a catastrophic event, conditions critical to the fishes health would be monitored and if deemed necessary, the fish would be released prematurely to prevent their loss in the ponds.

10.11) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic and ecological effects to listed fish resulting from fish releases.

These fish are reared to fingerling size (typically 70 fpp). They are monitored closely for smolting activity in the spring of the year. The fish are released during periods of high flow and when they are displaying high levels of activity in the ponds (working the outlet screens and sides of the ponds). This is done to ensure that they will actively migrate downstream thus minimizing the time spent in the river and minimizing their interactions with wild fish.

SECTION 11. MONITORING AND EVALUATION OF PERFORMANCE INDICATORS

11.1) Monitoring and evaluation of "Performance Indicators" presented in Section 1.10.

Note: See section 1.10 for Monitoring and Evaluation. The purpose of a monitoring program is to identify and evaluate the benefits and risks which may derive from the hatchery program. The monitoring program is designed to answer questions of whether the hatchery is providing the benefits intended, while also minimizing or eliminating the risks inherent in the program. A key tool in any monitoring program is having a mechanism to identify each hatchery production group.

Each production group shall be identified with distinct otolith marks, adipose clips, coded wire tags, blank wire tags or other identification methods as they become available, to allow for evaluation of each particular rearing and/or release strategy. This will allow for selective harvest on hatchery stocks when appropriate, monitoring of interactions of hatchery and wild fish wherever they co-mingle in riverine, estuarine and marine habitats and assessment of the status of the target population. WDFW shall monitor the Chinook salmon escapement into the target and non-target Chinook populations to estimate the number of tagged, un-tagged and marked fish escaping into the river each year and the stray rates of hatchery Chinook into the rivers.

11.1.1) Describe plans and methods proposed to collect data necessary to respond to each "Performance Indicator" identified for the program.

WDFW shall continue to monitor chinook escapement to the Snohomish system to estimate the number of tagged, untagged and marked fish escaping to the river each year; e.g., spawning surveys with carcasses being found sampled for scales, otoliths, adipose-fin clips and CWT's. Also smolt trapping and estuarine surveys allow for more assessment of the status of the target population.

11.1.2) Indicate whether funding, staffing, and other support logistics are available or committed to allow implementation of the monitoring and evaluation program.

Funding and resources are currently committed to monitor and evaluate this program as detailed in the Resource Management Plan for Puget Sound Chinook Salmon Hatcheries (Washington Department of Fish and Wildlife and Puget Sound Treaty Tribes, August 23, 2002).

11.2) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic and ecological effects to listed fish resulting from monitoring and evaluation activities.

Monitoring and evaluation will be undertaken in a manner which does not result in an unauthorized take of listed chinook.

SECTION 12. RESEARCH

12.1) Objective or purpose.

There is currently no research being conducted using Wallace River summer chinook.

12.2) Cooperating and funding agencies.

12.3) Principle investigator or project supervisor and staff.

12.4) Status of stock, particularly the group affected by project, if different than the stock(s) described in Section 2.

12.5) Techniques: include capture methods, drugs, samples collected, tags applied.

12.6) Dates or time period in which research activity occurs.

12.7) Care and maintenance of live fish or eggs, holding duration, transport methods.

12.8) Expected type and effects of take and potential for injury or mortality.

12.9) Level of take of listed fish: number or range of fish handled, injured, or killed by sex, age, or size, if not already indicated in Section 2 and the attached "take table" (Table 1).

12.10) Alternative methods to achieve project objectives.

12.11) List species similar or related to the threatened species; provide number and causes of mortality related to this research project.

12.12) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse ecological effects, injury, or mortality to listed fish as a result of the proposed research activities.

SECTION 13. ATTACHMENTS AND CITATIONS

Seidel, Paul. 1983. Spawning Guidelines for Washington Department of Fish and Wildlife Hatcheries. Washington Department of Fish and Wildlife, Olympia.

_____Washinton Department of Fish and Wildlife. 1996. Fish Health Manual. Hatcheries Program, Fish Health Division, Washington Department of Fish and Wildlife, Olympia.

Washington Department of Fish and Wildlife and Puget Sound Treaty Tribes, 2002, "Puget Sound Chinook Salmon Hatcheries, Resource Management Plan", a component of Comprehensive Chinook Salmon Management Plan, August 23, 2002. 103 pages.

Washington Department of Fish and Wildlife and Washington Treaty Indian Tribes. 1998. Salmonid Disease Control Policy of the Fisheries Co-Managers of Washington State. Olympia

Washington Department of Fish and Wildlife and Washington Treaty Indian Tribes. 2001. Current Brood Document.

SECTION 14. CERTIFICATION LANGUAGE AND SIGNATURE OF RESPONSIBLE PARTY

"I hereby certify that the foregoing information is complete, true and correct to the best of my knowledge and belief. I understand that the information provided in this HGMP is submitted for the purpose of receiving limits from take prohibitions specified under the Endangered Species Act of 1973 (16 U.S.C.1531-1543) and regulations promulgated thereafter for the proposed hatchery program, and that any false statement may subject me to the criminal penalties of 18 U.S.C. 1001, or penalties provided under the Endangered Species Act of 1973."

Name, Title, and Signature of Applicant:

Certified by_____ Date:_____

Table 1. Estimated listed salmonid take levels of by hatchery activity.

Listed species affected: Chinook ESU/Population: Puget Sound Activity: Fingerling Summer Chinook Program				
Location of hatchery activity: Wallace River Dates of activity: July thru June Hatchery program operator: WDFW				
Type of Take	**Annual Take of Listed Fish By Life Stage *(Number of Fish)***			
	Egg/Fry	Juvenile/Smolt	Adult	Carcass
Observe or harass a)				
Collect for transport b)				
Capture, handle, and release c)				
Capture, handle, tag/mark/tissue sample, and release d)				
Removal (e.g. broodstock) e)			Unknown	
Intentional lethal take f)				
Unintentional lethal take g)	Unknown	Unknown	Unknown	
Other Take (specify) h)				

a. Contact with listed fish through stream surveys, carcass and mark recovery projects, or migrational delay at weirs.

b. Take associated with weir or trapping operations where listed fish are captured and transported for release.

c. Take associated with weir or trapping operations where listed fish are captured, handled and released upstream or downstream.

d. Take occurring due to tagging and/or bio-sampling of fish collected through trapping operations prior to upstream or downstream release, or through carcass recovery programs.

e. Listed fish removed from the wild and collected for use as broodstock.

f. Intentional mortality of listed fish, usually as a result of spawning as broodstock.

g. Unintentional mortality of listed fish, including loss of fish during transport or holding prior to spawning or prior to release into the wild, or, for integrated programs, mortalities during incubation and rearing.

h. Other takes not identified above as a category.